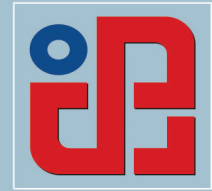




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**BOOK OF ABSTRACTS**

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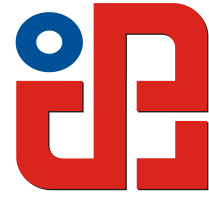
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First Scientific Conference with International Participation

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## **CHARACTERIZATION OF WASTE COMPUTER PROCESSORS AND PROPOSAL OF THE METALS VALORIZATION PROCESS**

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**Abstract:** Given the constant development of the high-tech industry, consumer-oriented societies, and reduced electronic equipment's lifespan, the outcome of growth and accumulation of waste is inevitable. Yet, specific electronic equipment components, such as central processing unit (CPU), are carriers of valuable metals, primarily precious, so waste electronic equipment becomes of recyclable interest. However, inadequate technological processing, particularly in the informal recycling sectors, leads to valuable metals losses. This approach has a negative economic and environmental impact: valuable material is usually considered as waste and landfilled with metals trapped in it, while because of increasing demand, metals are being exploited from natural resources. In this sense, there is an unquestionable need for an innovative recycling approach and adequate waste management that would lead to i) the decrease of natural exploitation, ii) the removal of waste accumulated in the environment, and iii) better utilisation of material flows. The aim of this paper is an evaluation of the potential of waste CPU acid leaching residue as secondary material and the proposal of the innovative design of an adequate technological process for CPU recycling and recovery of valuable metals while minimising their loss. The first part of the study included the characterisation of the CPU acid leaching residue. Results of the research point out that precious metals content is significant, and material could be further exploited as secondary raw material. However, further optimisation of process parameters is needed to achieve the most efficient

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valorisation. A conceptual proposal of the technological scheme for metal recovery is given in the second part, considering two approaches: hydro- and pyrometallurgical methods. An innovative approach for recycling and waste management can contribute to the ultimate goal nowadays globally set as an imperative: achieving a circular economy through improved material flows management.

**Keywords:** electronic waste, central processing unit, recycling, precious metals, circular economy